



512F ebmpapst

Brand: ebmpapst

SKU: 512F

Category: Axial compact fans

URL: <https://www.fansco.com/item/512f-ebmpapst/>

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Product Description

512F ebmpapst DC12V 20m3/h 50x50x15mm 30dB(A) 4.5B 5000RPM Sintec Bearing 2Wire Leads axial fan.

1. Product Positioning & Core Characteristics:

Product Type: The ebm-papst 512F is a high-performance, high-reliability DC Axial Fan.

Brand & Series: It originates from the renowned German fan manufacturer ebm-papst, belonging to their 500F series. Ebm-papst enjoys a global reputation for quality, durability, and technological leadership, typically positioning its products for mid-to-high-end industrial and professional applications.

Core Selling Points: Its primary attributes are delivering stable and reliable cooling performance within an extremely compact (50x50x15mm) form factor, while effectively balancing energy efficiency and noise control.

2. Key Performance Indicator Analysis:

Size & Integrability: The 50x50x15mm dimensions represent a small fan specification, making it exceptionally suitable for applications with severe space constraints, such as compact electronic devices, embedded systems, and miniaturized instrumentation. Its low weight of 24.95 grams (0.055 lbs) also minimizes its impact on the overall device load.

Cooling Capacity: Operating at the standard 12VDC and a speed of 5000 RPM, it provides an airflow of 12 CFM (approx. 0.336 m³/min). This airflow is quite respectable for its size, sufficient for effective forced-air cooling of localized hotspots or small sealed enclosures. It's important to note that actual effective airflow is dependent on system impedance (back pressure); the P-Q curve (Pressure vs. Airflow) in the datasheet provides a more comprehensive view of its performance under various load conditions.

Energy Efficiency: With a nominal power consumption of only 1W, it demonstrates high operational efficiency, which is advantageous for power-sensitive applications (like battery-powered devices or systems where overall energy consumption needs control).

Noise Level: The nominal noise level is rated at 30 dB(A). This is considered relatively quiet but not silent, potentially perceptible in very quiet environments (e.g., libraries, bedrooms). For most industrial, commercial, or non-critical consumer electronics applications, this noise level is generally acceptable. The sound power level of 4.5 B provides an alternative metric.

3. Reliability & Durability Design:

Bearing Type: It utilizes the Sintec bearing system. This is typically ebm-papst's

branded and enhanced version of a sleeve bearing, designed to offer longer life and better stability than traditional sleeve bearings, while often being quieter and more cost-effective than ball bearings. Its lifespan generally falls between standard sleeve and ball bearings, particularly at moderate operating temperatures.

Operating Temperature Range: The wide operating temperature range of -20°C to +70°C highlights its robustness and adaptability to various demanding industrial or outdoor environments.

International Certifications: Holding certifications from major agencies like CE, CSA, UL, and VDE serves as a guarantee of product safety and quality. It also means the fan can be readily integrated into products destined for global markets, meeting diverse regional regulatory requirements.

Brand Reputation: The ebm-papst brand itself is synonymous with high quality and reliability. Their products typically feature long design lives (often quantified by L10 life expectancy data, indicating the time by which 90% of fans are expected to still be operational under specified conditions).

4. Speculative Application Scenarios:

Embedded Systems Cooling: Providing spot cooling for CPUs, FPGAs, or other heat-generating components.

Networking & Communication Equipment: Cooling within compact routers, switches, or small cell equipment.

Industrial Control Cabinets/Automation: Cooling PLC modules, drives, or other small control units.

Medical Devices: Use in portable or desktop medical instruments requiring small, reliable fans.

Small Power Supplies or Inverters: Auxiliary cooling.

High-End or Professional-Grade Consumer Electronics: Such as compact projectors or high-performance mini-PCs (though potentially at a higher cost than typical consumer-grade fans).

5. Market Considerations & Conclusion:

Strengths: Compact design, high brand reliability, balanced performance (airflow/noise/power), wide operating temperature range, comprehensive global certifications.

Potential Considerations: Likely higher price point compared to generic brands of similar size; Sintec bearing lifespan, while enhanced, might be shorter than ball bearings under extreme high temperatures or specific mounting orientations; the 30 dB(A) noise level might still require evaluation for ultra-quiet sensitive applications.

Conclusion: The ebm-papst 512F is a high-quality, small DC cooling fan primarily

aimed at the professional market. It doesn't necessarily strive for maximum possible airflow or absolute silence, but rather achieves an excellent balance between compact size, reliability, energy efficiency, and cooling capability. When an application demands operation in tight spaces, requires long-term stability, needs to withstand varied environmental conditions, and necessitates compliance with international standards, the 512F stands out as a highly dependable choice. Its potentially higher initial investment is often justified by reduced failure rates and an extended operational lifespan.

Technical Specifications

Attribute	Value
Part Number	512F
Manufacturer	ebm-papst
Air Flow	12 CFM
Voltage Range	10.8~13.2V
Fan Type	DC
Noise Level	30 dB(A)
Sound power level	4.5B
Dimensions	50x50x15 mm
Air Flow (m3)	0.336m ³ /min
Series	500F
Voltage Rating	12 VDC
Bearing Type	Sintec Bearing
Power Rating	1 W
Fan Speed	5000 RPM
Termination	2 Wire Leads
Operating Temperature	-4 ~ 158°F (-20 ~ 70°C)
Approval Agency	CE, CSA, UL, VDE
Weight	0.055 lb (24.95 g)
Subcategory	Tubeaxial



